

## ABSTRACT OF THE DISCLOSURE

The frame words of the preferred embodiment are especially suitable for frame synchronization and/or channel estimation. By adding the autocorrelation and cross-correlation functions of frame words, double maximum values equal in magnitude and opposite polarity at zero and middle shifts are obtained. This property can be used to slot-by-slot, double-check frame synchronization timing, single frame synchronization and/or channel estimation and allows reduction of the synchronization search time. Further, the present invention allows a simpler construction of a correlator circuit for a receiver. A frame synchronization apparatus and method using an optimal pilot pattern is used in a wide band code division multiple Access (W-CDMA) next generation mobile communication system. This method includes the steps of storing column sequences demodulated and inputted by slots, in a frame unit, in detecting frame synchronization for upward and downward link channels; converting the stored column sequences according to a pattern characteristic related to each sequence by using the pattern characteristic obtained from the relation between the column sequences; adding the converted column sequences by slots; and performing a correlation process of the added result to a previously designated code column.